CASE REPORT : INTRAOCULAR GNATHOSTOMIASIS IN VIETNAM

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Abstract. This is the report of the first case of intraocular gnathostomiasis diagnosed in Vietnam. The disease progressed in two months in two distinct phases: in the first phase, the patient had swellings, which appeared at different times and in different locations, on his face – this phase lasted around one month; the second phase was the embedding of the parasite in the vitreous cavity of the right eye and uveitis. Surgical extraction of a living *Gnathostoma* larva was carried out. Based on morphological, histological criteria, the larva may have been an atypical third-stage of *Gnathostoma spinigerum*.

Involvement of the eye is a rare complication of gnathostomiasis. The first case was reported by Rhithibaed and Daengsvang in Thailand in 1937. Some 20 cases have been documented, 18 of which were due to *Gnathostoma spinigerum* (Le-Van-Hoa, 1965; Khin, 1968; Choudhury, 1970; Tudor and Blair, 1971; Bashirullah, 1972; Bathrick *et al*, 1981; Kittiponghansa *et al*, 1987; Biswas *et al*, 1994; Chhuon *et al*, 1976), one was due to *G. hispidum* (Chen, 1949), and another was due to *G. doloresi* (Sasano *et al*, 1994).

The present case is reported not only because it is the first case of *Gnathostoma* eye infection in Vietnam, but also because of the uncertainty surrounding its identification.

CASE REPORT

A 39-year-old Vietnamese man was admitted to Cho Ray Hospital on December 30, 1998, because of blurred vision and irritation of the right eye for one month. About two months previously, he had suffered from migratory swellings on the righthand side of his right face: first on the right cheek and then on the chin and upper lip. Later, an itch developed in his right eye and the area around the eye became swollen. One month later, he developed redness of and photophobia in the affected eye and a gradual decrease in visual acuity. He sought care at a local hospital, was diagnosed with uveitis, and prescribed systemic and local steroids. The symptoms, except the poor vision, gradually subsided.

The patient was a farmer living in Dong Thap in the Mekong Delta; he was accustomed to eating undercooked or roasted fish and drinking plain ground water.

Ocular examination revealed an apparently normal left eye with a visual acuity of 20/20, while the visual acuity of the right eye, only 20/70, did not improve even with an added lens. No sign was seen on the lids, conjunctiva or cornea. The anterior chamber was clear.

Two full-thickness holes were seen in the iris at the 7 o'clock and 9 o'clock positions. The pupil and the crystalline lens were normal.

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With the slit-lamp and the biomicroscope with a three-mirror Goldman's lens, 2+ flares and cells and some opacifications could be seen in the vitreous. There was a gray-bluish striation above the macula running from the optic nerve heading to the peripheral retina with some bleeding around it. Hemorrhages were seen in the lower part of the vitreous and retina. There was a worm that curled up and floated in the vitreous cavity at the 11 o'clock position, next to the ora serrata. The larva was alive, moving sometimes. It had a blood cord running from the head to the tail and it was connected to a blood striation in the vitreous cavity and adhered to the inferior retina.

The white blood count performed on December 31, 1998, showed 38.7% polymorphonuclear leukocytes and 7.4% eosinophils. ELISA using *G. spinigerum* larval antigen was performed and showed an IgG antibody titer of 1:400. Stool examination for ova and parasites was negative. Treatment comprised systemic and local steroids.

On January 8, 1999, an operation was performed, and an intact, live worm was removed from the vitreous cavity through a pars-plana incision of the inferior temporal quadrant. The worm remained alive for about eight hours in normal saline; it was then fixed in 10% formalin.

Four days after the operation, the patient's vision improved to 14/20 without correction. Blood examination showed a white blood cell count of 17,850 per mm^3; 78% polymorphonuclear cells; 22% lymphocytes; 1% eosinophils, and 1% monocytes.

While alive, the worm was red-orange in color and measured approximately 6 mm (length) by 0.6 mm (maximum width) (Fig 1). The morphology of the hooklets and the presence of body spines of the larva were examined under a light-microscope. A cross-section, 4 μm thick, was made and stained with hematoxylin and eosin.

The head bulb had four rows of hooklets. The number of hooklets was 43, 47, 49 and 51 (first to fourth rows), as shown in Table 1. A precise hooklet count was not possible with a lateral view. Most of the cephalic hooklets had an irregular base. Hooklets in the first row were somewhat square and conspicuously smaller than those in the other rows, which were narrower and longer posteriorly (Table 1; Figs 2 and 3). Spination of the body was prominent over its anterior half, but the single, pointed 10 μm-long spines became progressively shorter posteriorly; they were absent on the last quarter of the body. The intestinal wall in cross-section consisted of a single layer with many elongated cells, most of which had 3-7 nuclei (Fig 4).

This is the first reported case of intraocular gnathostomiasis in Vietnam. The larva had migrated into the vitreous cavity following an aimless migration around the patient's face. A possible explanation for the entry of the parasite into the eye was that it first invaded the globe by one of the short ciliary arteries and then passed into the choroid where it left a trace. Next it entered the posterior chamber,

Table 1
The number and size of cephalic hooklets of the *Gnathostoma* larva.

	Number of hooklets	Width (μm; n = 10) Mean ± SD	Length (μm; n = 10) Mean ± SD
Row 1	43	10.10 ± 3.44	10.10 ± 3.26
Row 2	47	10.53 ± 4.10	11.34 ± 3.80
Row 3	49	9.59 ± 4.03	12.96 ± 3.29
Row 4	51	9.32 ± 2.70	13.90 ± 2.87

Fig 1–Photomicrograph of the *Gnathostoma* larva recovered from the vitreous cavity of the patient.

Fig 2–The headbulb of the larva.

Fig 3–Cephalic hooklets of the larva.

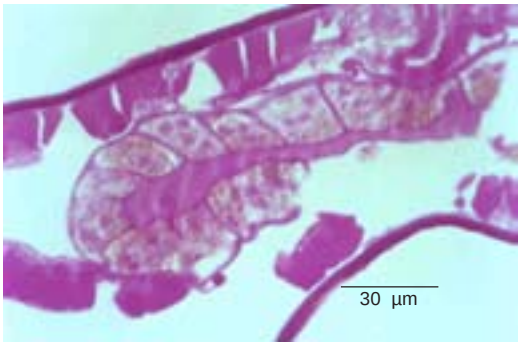

Fig 4–Cross section of the larva, showing 3-7 nuclei in the intestinal epithelium cells.

made a hole in the iris, and moved to the anterior chamber, where it made another hole, before returning to the posterior chamber and thus to the vitreous cavity. In most reported cases, the parasite was located in the anterior chamber; only in three cases was it found in the vitreous cavity (Biswas *et al*, 1994). The eosinophil count was normal in most of the other reported cases (Biswas *et al*, 1994), whereas in our case, a slight eosinophilia was noted (7.4%), which fell rapidly after the removal of the parasite (to 1% after one week).

The source of infective larvae in this case could have been fish, since the patient lived in a province in the Mekong Delta that is rich with canal and river water; the patient was accustomed to eating undercooked or roasted fish. The third-stage larva of *Gnathostoma* is identified by its morphology, the number of cephalic hooklets (Miyazaki, 1960), or the morphology of cross-sectioned intestinal epithelium cells (Akahane *et al*, 1986). The features of the larva in this report were similar

to those of *G. spinigerum* larvae, although the shape of the cephalic hooklets was different because those of *G. spinigerum* usually have an oblong base and measure about 16 x 8 μm, except in the first row (13 x 8 μm). The hooklets of the larva in this case had an irregular base and measured about 11-13 x 10-9 μm (rows 2-4), and 10 x 10 μm in the first row. Our preliminary conclusion was that the worm could have been an atypical larva of *G. spinigerum*.

In Vietnam, four species of *Gnathostoma* have been identified: *G. spinigerum*, *G. hispidum*, *G. doloresi* and *G. vietnamicum* (Le-Van-Hoa *et al*, 1965). *G. hispidum* and *G. doloresi* were found only in pigs (Pham Van Khue, 1982; Luong Van Huan, 1994), *G. vietnamicum* in otters (Le-Van-Hoa, 1965) and *G. spinigerum* in dogs, cats and man (Tran Xuan Mai, 1992). An epidemiological survey of *Gnathostoma* larvae in their second intermediate hosts (eels) in Ho Chi Minh City showed an infection rate of 11%; all of the recovered larvae were *G. spinigerum* (Le Thi Xuan and Rojekittikhun, 2000). Until now, 10 cases of human gnathostomiasis have been confirmed: all were caused by *G. spinigerum* (Le Thi Xuan, unpublished data).

Based on the findings of our examination, especially the 3-7 nuclei in the intestinal cells, and the history of the patient's ailments, we believe that the larva was of *G. spinigerum*. The difference in the shape of hooklets between our larva and those typical of *G. spinigerum* may have been due to individual variation or abnormality.

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